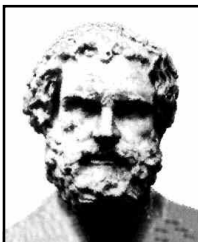


Aristotle
384-322 B.C.

He was an early Greek philosopher who concluded that all matter is composed of four fundamental elements:

Air
Earth
Fire
Water



Democritus
460- 370 B.C.

Proposed an atomic model that said matter was made up of tiny indivisible parts we call atoms (*a tomos* is Greek for “not cut” or “that which is indivisible”) He believed that once you got down to an atom, you couldn’t split that atom apart.



Antoine Lavoisier
1743-1794

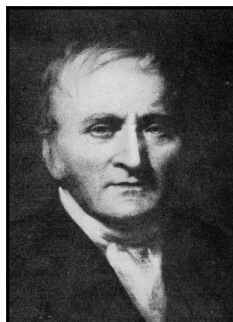
The father of modern chemistry.
He noticed that although matter may change its form or shape, its mass always remains the same.
Law of Conservation of Mass.



Joseph Proust
1754-1826

Law of Definite Proportions

All compounds contain elements in a fixed proportion.



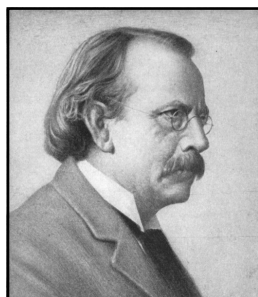
John Dalton
(1766-1844)

Dalton was born in England and was a self-taught teacher whose own schooling stopped at age 11.

In 1803, Dalton developed a set of claims he believed to be true based on the work of others like Lavoisier, Proust, and Democritus called atomic theory:

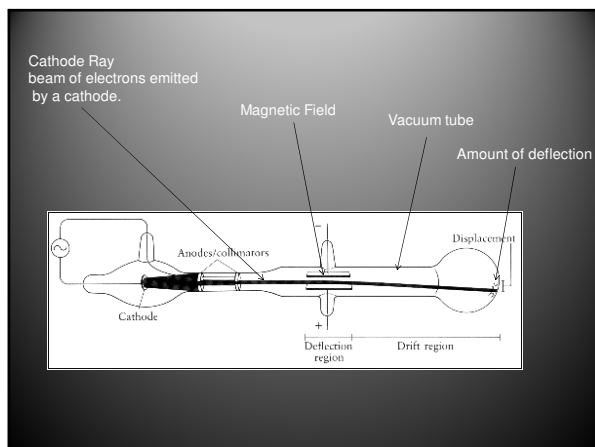
Dalton's Atomic Theory

1. The atoms of a given element are different from those of any other element; the atoms of different elements can be distinguished from one another by their respective relative atomic weights.
2. All atoms of a given [element](#) are identical.
3. Atoms of one element can combine with atoms of other elements to form [chemical compounds](#); a given compound always has the same relative numbers of types of atoms.
4. Atoms cannot be created, divided into smaller particles, nor destroyed in the chemical process; a [chemical reaction](#) simply changes the way atoms are grouped together.
5. Elements are made of tiny particles called [atoms](#).



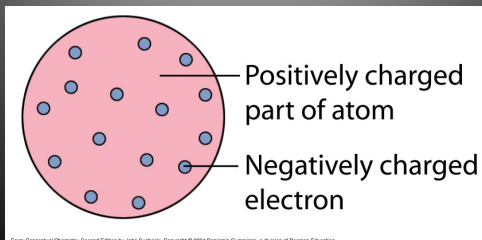
Joseph John (J.J.) Thomson
1856-1940


Using a cathode ray tube and a magnet, Thomson discovered that a beam of light would bend towards the positive side of the magnet and declared that the beam contained **negatively charged particles called electrons.**



J.J. Thompson's Plum Pudding Model

The nucleus is still not known to exist, this model describes how the negative electrons are surrounded by a positive soup of positive charge.

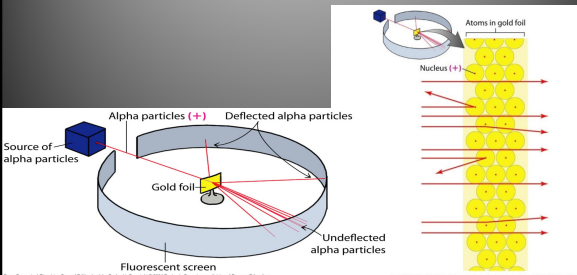




Ernest Rutherford
(1871-1937)

In 1910, Rutherford discovered the **presence of the nucleus** with his famous Gold Foil Experiment. Some consider this to be his greatest scientific accomplishment.

Rutherford's Gold Foil Experiment



Source of alpha particles

Alpha particles (+)

Deflected alpha particles

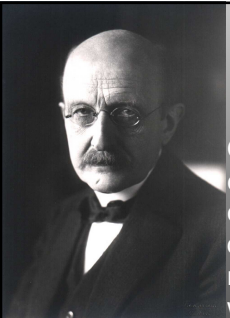
Gold foil

Fluorescent screen

Undeflected alpha particles

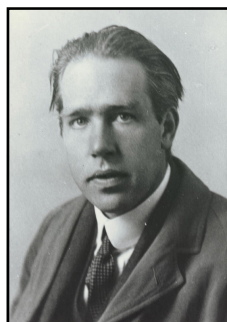
Nucleus (+)

Atoms in gold foil



Max Planck
1858-1947

Quantum Theory. The energy emitted by a resonator could only take on discrete values or quanta. The energy for a resonator of frequency ν is $h\nu$ where h is a universal constant, now called Planck's constant. The father of Quantum Physics.

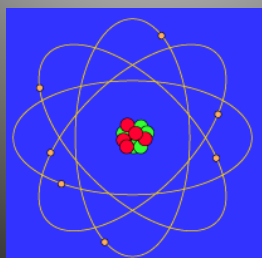


Niels Bohr
(1885-1962)

Won the Nobel Prize in 1922 for his work on atomic structure suggesting that atoms emit electromagnetic radiation as they move from one fixed energy level to another.

Worked on the atomic bomb (the Manhattan project) for the United States.

Bohr's Atomic Model



● Proton
● Neutron
● Electron



James Chadwick
1891-1974

In 1932 Chadwick made a fundamental discovery in the domain of nuclear science: he discovered the particle in the nucleus of an atom that became known as the neutron because it has no electric charge. This discovery was supported by the existence of isotopes of atoms.



Erwin Schrodinger
(1887-1961)

Developed the wave equation which said that you can't pinpoint to exact location of an electron, only the probability that it is somewhere.

Won the Nobel prize in 1933 for his work on atomic structure. His version of atomic structure was the **electron cloud model**.

Current Atomic Model

